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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/727,018

12/02/2003

Bruce McArthur

38203-6080C

4422

33123

7590

10/19/2004

DAVID A. HALL
HELLER EHRMAN ET AL.
4350 LA JOLLA VILLAGE DRIVE #700
SAN DIEGO, CA 92122

EXAMINER

STOCK JR, GORDON J

ART UNIT

PAPER NUMBER

2877

DATE MAILED: 10/19/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/727,018

Applicant(s)

MCARTHUR ET AL.

Examiner

Gordon J Stock

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 7/30/04;9/20/04.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-53 is/are pending in the application.
- 4a) Of the above claim(s) 19-44 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-18,45-53 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 02 December 2003 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. Preliminary Amendment received on September 20, 2004 has been entered into the file.

Election/Restrictions

2. Applicant's election without traverse of Species I (**claims 1-18, 45-53**) in the reply filed on July 30, 2004 is acknowledged.

Claims 19-44 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected species, there being no allowable generic or linking claim. Election was made **without** traverse in the reply filed on July 30, 2004.

Drawings and Specification

3. **Figures 1-4a, 17, 18, 19, 28-31** should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). Corrected drawings in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.121(d)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.
4. The drawings and specification are objected to as failing to comply with 37 CFR 1.84(p)(5) because they include the following reference character(s) not mentioned in the description: **4'** of **Fig. 44**; **35a, 35b, 3502, 3504** of **Fig. 35**; **3442-3456** of **Fig. 34a**; **2104, 2106** of **Fig. 21**; **2402** of **Fig. 24**; **26** of **Fig. 25**; **27** of **Fig. 26**; **33** and **33a** of **Fig. 32**. In addition, **Fig. 21** is objected for the specification mentions **2100** that is not in the drawing. Also **Figs. 44 and**

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45 need to be separated from each other in order to be clear. Corrected drawing sheets in compliance with 37 CFR 1.121(d), or amendment to the specification to add the reference character(s) in the description in compliance with 37 CFR 1.121(b) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

5. The specification is objected to for the following: on page 15 line 18 'block 3402' should read --block 3404--; on page 37 line 14 '43202' should read --4302--. Corrections are required.

6. The lengthy specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

Double Patenting

7. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686

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F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

8. **Claims 1, 2, 4, 6, 7** are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over **claims 1-3, and 9** of **U.S. Patent No. 6,573,986 (Smith et al.)**. Although the conflicting claims are not identical, they are not patentably distinct from each other because **claims 1, 2, 4, 6, and 7 and claims 1-3** are both method claims for determining intra-field distortion in a projection imaging tool; whereas, the method comprising exposing a reticle pattern in two positions thereby having an alignment attribute comprising an overlay of at least two arrays of alignment attributes with desired directions in both x and y directions; whereas, the alignment attributes are marks on a semiconductor wafer.

9. **Claim 3** is rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over **claim 9** of **U.S. Patent No. 6,573,986 (Smith et al.)**. As for **claim 3** see above with **claim 2** and **claim 9 (Smith et al.)**. In addition, as for **claim 3**, claim 9 of Smith is silent concerning measuring using a lithography tool wafer alignment mark measurement system. However, it is well-known in the art that exposure systems have alignment

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measuring systems for proper positioning of the wafer with the reticle. Therefore, it would be obvious to one of ordinary skill in the art at the time the invention was made to have the measuring of the positional offsets be performed by a lithography tool wafer alignment mark measurement system, for photolithographic exposure apparatus have the mask and wafer properly aligned and positioned through using a wafer alignment mark measurement system to measure mark positions.

10. **Claims 8-13** are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over **claim 1** of U.S. Patent No. 6,573,986 (**Smith et al.**) in view of applicant's disclosure of prior art. As for **claims 8-13** see above with **claim 7** and **claim 1 (Smith et al.)**. In addition, as for **claims 8-13**, **claim 1** of Smith is silent concerning the particular type of alignment attribute. However, applicant's disclosure of prior art teaches the following typical alignment attributes: box in box, frame in frame (Fig. 14), gratings, vernier pairs, Van der Pauw resistors, capacitor structures (page 14 lines 5-12). Therefore, it would be obvious to one of ordinary skill in the art at the time the invention was made to have the alignment attributes comprise any of the following: box in box, frame in frame, gratings, vernier pairs, Van der Pauw resistors, capacitor structures, for these are art recognized equivalents for measuring overlay on wafer substrates.

Claim Rejections - 35 USC § 102

11. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

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(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

12. **Claims 1-8** are rejected under 35 U.S.C. 102(b) as being anticipated by **Ota (6,061,119)**.

As for **claims 1-8**, Ota discloses the following: exposing a reticle pattern onto a substrate with a recording media in a first position and a second position to form a complete alignment attribute that is an alignment wafer mark of the box in box type, wherein the reticle pattern includes at least two arrays of alignment attributes, a square array with main measure and sub-measure pattern (Fig. 6a, 6b, 7b); measuring positional offsets of the alignment attributes and determining a lens distortion map (Fig. 2: 120-140; Fig. 3: 150-160; Fig. 4: 150-151); wherein a measurement mark system is used (Figs. 5 and 11); and two directions are used x and y (Fig. 1: W10 and W20; Fig. 7b).

13. **Claims 1-8, 14-18, 45, 46, 49, 50** are rejected under 35 U.S.C. 102(a) as being anticipated by **Shiode et al. (6,633,390)**.

As for **claims 1-8, 14-18, 45, 46, 49, 50**, Shiode in a focus measurement system discloses the following: projecting with a circular (curved) field and exposing reticle pattern using the curved field (Fig. 15); exposing the reticle in a first and second position wherein an alignment attribute during the first and second exposure form a completed box in box wafer mark attribute (Figs. 6, 7a, 7b, 8a, 8b, 14, 16); measuring positional offsets and determining a distortion map with positions determined in the x and y direction (Figs. 12a, 12b, 13a, 13b; 17; col. 23, lines 35-40; col. 25, lines 1-15); with wafer alignment mark measurement system (col. 5, lines 15-20); an x and y tilt Zernike and higher order Zernike polynomials are determined (col. 18, lines 55-67; col. 19, lines 1-50).

Claim Rejections - 35 USC § 103

14. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

15. **Claims 9-13** are rejected under 35 U.S.C. 103(a) as being unpatentable over **Ota (6,061,119)** in view of applicant's disclosure of prior art.

As for **claims 9-13**, Ota discloses everything as above (see **claim 7**), and discloses a box in box alignment attribute (Fig. 7b). However, he is silent concerning the other type of alignment attributes. However, applicant's disclosure of prior art teaches the following typical alignment attributes: box in box, frame in frame (Fig. 14), gratings, vernier pairs, Van der Pauw resistors, capacitor structures (page 14 lines 5-12). Therefore, it would be obvious to one of ordinary skill in the art at the time the invention was made to have the alignment attributes comprise any of the following: box in box, frame in frame, gratings, vernier pairs, Van der Pauw resistors, capacitor structures, for these are art recognized equivalents for measuring overlay on wafer substrates.

16. **Claims 9-13, 47, 48, 51-53** are rejected under 35 U.S.C. 103(a) as being unpatentable over **Shiode et al. (6,633,390)** in view of applicant's disclosure of prior art.

As for **claims 9-13**, Shiode discloses everything as above (see **claim 7**) and discloses a box in box wafer mark (Fig. 16). However, he is silent concerning the other type of alignment attributes. However, applicant's disclosure of prior art teaches the following typical alignment attributes: box in box, frame in frame (Fig. 14), gratings, vernier pairs, Van der Pauw resistors,

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capacitor structures (page 14 lines 5-12). Therefore, it would be obvious to one of ordinary skill in the art at the time the invention was made to have the alignment attributes comprise any of the following: box in box, frame in frame, gratings, vernier pairs, Van der Pauw resistors, capacitor structures, for these are art recognized equivalents for measuring overlay on wafer substrates.

Fax/Telephone Numbers

If the applicant wishes to send a fax dealing with either a proposed amendment or a discussion with a phone interview, then the fax should:

- 1) Contain either a statement "DRAFT" or "PROPOSED AMENDMENT" on the fax cover sheet; and
- 2) Should be unsigned by the attorney or agent.

This will ensure that it will not be entered into the case and will be forwarded to the examiner as quickly as possible.

Papers related to the application may be submitted to Group 2800 by Fax transmission. Papers should be faxed to Group 2800 via the PTO Fax machine located in Crystal Plaza 4. The form of such papers must conform to the notice published in the Official Gazette, 1096 OG 30 (November 15, 1989). The CP4 Fax Machine number is: (703) 872-9306

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Gordon J. Stock whose telephone number is (571) 272-2431.

The examiner can normally be reached on Monday-Friday, 10:00 a.m. - 6:30 p.m.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gregory J. Toatley, Jr., can be reached at 571-272-2800 ext 77.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished

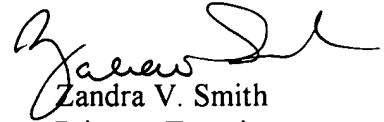
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applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private Pair system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



gs

October 15, 2004



Zandra V. Smith
Primary Examiner
Art Unit 2877